

## Recycled Tire Sewage Treatment Apparatus and Method

### 1. Field of Invention

This invention relates generally to sewage treatment systems, specifically to a system composed primarily of used tires.

### 2. Background[Prior Art]

[Septic tank and drainfield combinations have been utilized for sewage treatment and disposal for over one hundred years and are in the common knowledge of the general public.

Used tires and their properties are familiar to most members of the general public.

Use of tires bound together as components in a sewage treatment and disposal system is not in the prior art.]

### [Objects and Advantages

In that light, objects and advantages of the invention are to provide an economical use for recycled tires, and to provide an economical equivalent to existing sewage treatment methods.]

### [Drawing Figures]

Fig. 1 is a side view of the first step in the construction process of the invention-gluing two used tires together.

Fig. 2 is a side view of a completed component-in this case many used tires glued together.

Fig. 3 is a frontal view of a used tire prepared for drainage of treated sewage by the addition of hole D.

Fig. 4 is a side view of one example of a completed sewage treatment system constructed primarily of used tires.

Fig. 5 is a top view of a plastic plate used to seal a tire except for pipe entry holes.

Fig. 6 is a top view of a plastic plate use to seal a used tire.

Fig. 7 is a side view of a septic tank or pump tank unit constructed of used tires and plastic plates.

[ Summary

In accordance with the invention, used tires are glued together with industrial glue to form components of a sewage treatment system. To form a septic tank the section of tires glued together is capped with a plastic plate with pipe holes, and a plastic plate without holes is glued to the bottom. The section of tires glued together to form a drainfield line or chamber is capped at the front end with a glued-on plastic plate with a pipe hole in it. The tires are further enhanced for this use by the addition of holes in the bottom edge of the tires to allow drainage of the treated sewage.]

[ Fig. 1-Description and operation of major components  
Used tire A is glued with industrial glue B to used tire C. This process is repeated to form the desired length of the specific sewage treatment component-septic tank, pump tank, drainfield line or chamber, clear well, distribution box, wetland cell, chemical containment unit or other desired component.

Fig. 2-Description and operation drainfield sedimentation chamber or drainfield line or chamber

Used tire A is glued to used tire C with industrial glue B to form a chamber which may be used as a drainfield line or chamber, or with the addition of end plates E and H as shown in figures 5 and 6, as a sedimentation basin in a horizontal orientation.

Fig. 3-Description and operation of tire aperture

Hole D is drilled into used tire A to provide drainage of the treated sewage effluent from unit Z in figure 4.

Fig. 4-Description and operation of a complete sewage treatment system constructed primarily of used tires.

Unit Z, a sedimentation, receives sewage from pipe x. Pipe x passes through plastic lid E which is glued onto tire A. The sewage is contained within the glued-together tires by bottom cap H. The clarified effluent passes through pipe y up through cover plate F and into the drainfield chamber through another plastic plate E with a single pipe hole. Used tire A is glued to used tire C with industrial glue B, and this process is repeated with successive tires until the desired component length is achieved.. Sewage effluent flows from pipe y, through end plate E, into the chamber. The treated sewage flows down the length of this chamber, draining through holes D into the soil or other absorbent media.

Fig. 5-Description and operation of end plate.

Plastic plate E of sufficient size to cover the tire hole of the first tire in the component is outfitted with holes F and G to allow passage of sewage influent and effluent through pipes.

Fig. 6-Description and operation of end cap without apertures.

Plastic plate H of sufficient size is selected to cover the end of used tire sewage treatment components from which no flow is desired.

Fig. 7-Description and operation of generic used tired component.

Used tire assemblage Z is outfitted with top cover E and bottom plate H.]

[The single unit illustrated in figure 4 may be sufficient for treatment of the entire sewage flow, depending upon tire size, soil type, geologic conditions, sewage flow per day, etc.. Multiple units may be used to increase capacity.]

The specifics contained in the above description should not be construed as limits on the scope of the invention. Many variations are possible within the teachings of the invention. For example, the basic sealed glued together tire unit could be utilized for a clear well, wetland cell, distribution box or other sewage treatment unit. In addition, liquid wastes other than sewage can be processed with this invention.

Thus the scope of the invention should be determined by the following claims and their legal equivalents.

[I claim:

1. A sewage treatment system for treating effluent from homes, bussiness, farms or other properties, comprising:
  - chambers consisting of used tires glued together with industrial glue,
  - plastic plates glued to the ends of used tire sections designed to hold fluid,
  - plastic plates having appropriate holes for the passage of pipes carrying influent and effluent,
  - pipes to conduct sewage influent to the sedimentation chamber,
  - pipes to conduct effluent from the sedimentation chamber to the drainfield-chamber or line,
  - a drainfield chamber consisting of used tires glued together with industrial glue,
  - a drainfield chamber with a plastic plate glued to the front end to allow containment of the fluid so that it will pass along the drainfield chamber,
  - a drainfield chamber with a plastic plate glued to the front end which has a hole in it to allow passage of a pipe carrying treated sewage into the interior of the drainfield chamber,
  - a drainfield chamber consisting of used tires glued together in which the tires have a hole drilled into the bottom edge to allow drainage of the treated fluid into the soil or other media.
2. The sewage system of claim 1 wherein a generic chamber consising of used tires glued together with industrial glue and fitted with appropriate end caps with or without holes which can be used for many sewage treatment components, such as clear wells, holding tanks, wetland cells, chemical addition containers or other components.
3. A method for converting used tires into a useful product by gluing them together with industrial glue, fitting these sections with appropriate end caps and piping, perforating the bottom of the tires as necessary, creating a sewage or other material treatment system.]

## Recycled Tire Sewage Treatment Apparatus and Method

## Abstract

The documented invention turns a major environmental and health liability into an asset by incorporating used tires in a sewage treatment system design. This novel use of a readily abundant waste product should help reduce the cost of new home or business construction, while reducing a hazard found in many communities. Due to the current fees charged for shredding or other treatment of used car and equipment tires, in some cases the treatment system may be essentially free.]

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## RECYCLED TIRE SEWAGE TREATMENT APPARATUS AND METHOD

CROSS-REFERENCES TO RELATED APPLICATIONSUS PATENT DOCUMENTSUS-2002/0179511 12-2002 WOFFORD 210/151US-2002/0179510 12-2002 WOFFORD 210/151US-5,941,238 08-1999 TRACY 126/641US-4,824,287 04-1989 TRACY 405/36FOREIGN PATENT DOCUMENTS2221479 02-1990 TRACY GREAT BRITAINSTATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENTNot ApplicableReference to a Microfiche AppendixNot ApplicableBACKGROUND OF THE INVENTION

## 1. Field of the Invention

This invention relates generally to sewage treatment systems, specifically to a system composed primarily of used vehicle tires. |

## 2. Description of the related art including information disclosed under 37CFR 1.97 and 1.98

Lawrence Tracy disclosed a sewage treatment system in Great Britain patent 2221479 utilizing discarded vehicle tires. Similar systems, termed "chamber" or "infiltrator" units are legally permitted and installed in Virginia and other United States for home construction. These systems, and the invention described herein, differ from the Tracy invention in that neither require a distribution pipe or gravel, as required in the Tracy configuration. Gravel is a major expense, and gravel placement is a major labor requirement in septic systems utilizing gravel. The use of a distribution pipe in the Tracy design requires cutting large holes in

both sides of the tire, and threading the distribution pipe through said holes. This contrasts with the invention disclosed herein, which requires only glue and a small drill for assembly of the body of the drain-field chamber. 2

The Tracy invention utilizes staples and other mechanical fasteners, in contrast to the following Disclosed invention, which seals the tires with chemical cement. Fastening tires with staples may allow the Wastewater to leak disproportionately from the anterior of the tire chamber, particularly in climates experiencing freeze-thaw soil conditions. 3

The invention described herein utilizes a waste product, resulting in economic and environmental benefits relative to new molded plastic components. 3 4

#### BRIEF SUMMARY OF THE INVENTION

An object of the invention is to provide a simplified method for utilizing discarded vehicle tires in the construction of waste fluid treatment systems. 5

Another object of the invention is to provide an apparatus to be used for the method noted above. 6

According to one aspect of the present invention, there is provided a method for construction of drain field tanks and chambers, which comprise the steps of gluing the tires together and fitting the resulting tank and chamber openings with appropriate covers. 6 7

According to another aspect of the present invention, there is provided a waste fluid treatment apparatus, which comprises tires glued together to form a settling tank prior to drain field chambers. 8

These and other advantages, features and objects of the invention will be appreciated upon review of the following description of the invention when comprehended in conjunction with the attached drawings with the understanding that modifications, variations and alterations may be accomplished by those skilled in the art of the field of the disclosed invention without departing from the spirit or scope of the claims appended hereto. 9

#### BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

Fig. 1 is a side view of the first step in the construction process of the invention-gluing two used tires together. 10

Fig. 2 is a side view of a completed component-in this case many used tires glued together. 11

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Fig. 3 is a frontal view of a used tire prepared for drainage of treated sewage by addition of an aperture. ~~12~~ 12

Fig. 4 is a side view of one example of a completed sewage treatment system primarily of used tires. 13

Fig. 5 is a top view of a plastic plate used to seal a tire except for pipe entry apertures. 14

Fig. 6 is a top view of a plastic plate used to seal a used tire. ~~15~~ 15

Fig. 7 is a side view of a septic tank or pump tank unit constructed of used tires and plastic plates. 16

### DETAILED DESCRIPTION OF THE INVENTION

To attain the objects as noted above the inventor analyzed established and innovative sewage treatment systems with a view to replacing new manufactured components with waste materials, while identifying the minimum components required for an operational unit. It was found that used vehicle tires could replace new molded plastic chamber components as well as concrete septic tanks with a minimum of modification.

The invention is predicated in this finding. ~~16~~ 17

More particularly, the present invention features the method of gluing used tires together to instantly construct a tank or chamber for use in sewage treatment. 18

Further, the invention features an apparatus, which comprises a settling tank manufactured from used tires connected by a pipe to a sewage treatment chamber or chambers constructed of used tires. 19

Briefly, according to the invention used tires are glued together with industrial glue to form components of as sewage treatment system. To form a septic tank the section of glued tires is capped with a plastic plate with pipe apertures and a plastic plate without apertures is glued to the bottom of said tank. The section of tires glued together to form a chamber is capped at the anterior end with a glued-on plastic plate with a pipe aperture. The tires are further enhanced by the addition of apertures in the bottom edge of the tires to allow drainage of the treated sewage. ~~20~~ 20

Now, preferred embodiments of the invention will be described with reference to the drawings. ~~21~~ 21

Fig. 1 is a side view showing an embodiment of the present invention. More specifically, the Figure shows an apparatus, which comprises a used tire A cemented to used tire C with industrial glue B. This is the building block unit of the invention. The process of gluing used tires together is continued as necessary to produce an apparatus of the desired dimensions. ~~22~~ 22

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This process results in a component, as in Fig. 2, in this illustration many tires glued together to the desired dimension as referenced above. This component in the illustrated horizontal orientation would be utilized as a sewage storage and treatment chamber in the preferred embodiment of the current invention . 23

Fig. 3 is a frontal view of used tire A prepared for drainage of sewage effluent by the cutting of aperture D. The size of aperture D can be adjusted to varying soil conditions, desired wastewater residence times, and other variables. For example, in sandy soils the apertures could be larger as the soil is able to absorb the fluid more rapidly than in clay soils. 24

Fig. 4 is a side view of one example of the preferred embodiment. a completed sewage treatment system composed primarily of used tires. In this example, unit Z, a sedimentation basin resulting from a vertical orientation of the process of repeatedly cementing tires together as described above, receives sewage from pipe X. Pipe X passes through plastic lid E which is glued onto tire A. The sewage is contained within the cemented tires by bottom cap H. The clarified effluent passes through pipe Y up through cover plate E and into the drain field chamber through another plate E with a single pipe aperture. Used tire A is glued to used tire C with industrial glue B, and this process is repeated with successive tires and glue until the desired component dimensions are achieved. Sewage flows from pipe Y, through end plate E, into the horizontally oriented sewage disposal chamber Y1. The treated sewage effluent flows down the length of the chamber Y1, draining through apertures D into the soil. 25

Now, the plates covering the ends of the chambers are detailed. In figure 5, plastic plate E of sufficient size to cover the original tire hole of the first tire A in Figure 4 is outfitted with holes F and G to allow passage of sewage influent and effluent pipes X and Y in Figure 4. 26

Fig. 6 is atop view of plastic plate H in figure 4 which serves to seal the bottom of the sedimentation basin Z in figure 4. Plastic plate H is of sufficient size to cover the end of the last tire of component Z in figure 4 designed to contain wastewater for sufficient time to allow proper sedimentation. This is further illustrated in figure 7 in which the used tire assembly labeled sedimentation basin Z in figure 4 is sealed with impermeable plate H on the bottom and covered with permeable plate E on top as shown in figure 4. Component Z in figure 7 may be considered a generic component for wastewater treatment, and utilized in either a horizontal or vertical orientation and with or without watertight seal plate H or permeable cover E. 27

The specifics contained in the above description should not be construed as limits on the scope of the

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invention. Many variations are possible within the teachings of the invention. For example, the basic sealed multiple tire chamber could be utilized as a clear well, wetland cell, distribution box, or other sewage treatment unit. In addition, liquid wastes other than sewage can be processed with this invention. 28

Thus the scope of the invention should be determined by the following claims and their legal equivalents: 29

CLAIMS

1. A treatment system which does not require a distribution pipe or gravel media for processing sewage and other fluids from homes, businesses, farms or other properties, comprising:
- A. vertically oriented sedimentation and horizontally oriented disposal chambers composed of used tires cemented in axial alignment with industrial glue;
  - B. plastic plates cemented to the ends of said tire assemblies forming water-tight chambers, said plastic plates possessing apertures as necessary for passage of pipes carrying sewage influent and effluent;
  - C. pipes to conduct influent to said sedimentation chambers;
  - D. pipes to conduct effluent from said sedimentation chambers to said disposal chambers;
  - E. said horizontal disposal chambers consisting of used tires cemented together and with apertures drilled into the bottom tires edges to allow drainage of effluent into the soil. 30
2. A method for construction of a sewage or other fluid treatment system from used tires comprising:
- A. cementing used tires in axial alignment with industrial glue;
  - B. orienting said tire assemblies in a vertical direction to form a sedimentation basin;
  - C. orienting said tire assemblies in a horizontal direction to form a disposal chamber;
  - D. cementing plastic plates to the open ends of said chambers to form watertight containers;
  - E. cutting apertures in said plates to allow passage of influent and effluent pipes as necessary;
  - F. attaching an influent pipe into said sedimentation basin through said aperture in said plastic plate sealing said sedimentation basin;
  - G. attaching an effluent pipe into said sedimentation basin through said aperture in said plastic plate sealing said sedimentation basin;
  - H. attaching said effluent pipe from said sedimentation basin into said disposal chamber through said aperture in said plastic plate sealing said disposal chamber;
  - I. Drilling or cutting apertures in the bottom edges of said tires comprising said disposal chamber. 31

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ABSTRACT OF THE DISCLOSURE

A simplified method of utilizing used vehicle tires in the construction of a waste fluid treatment system, and an apparatus for carrying out the same method, are disclosed. 32

The apparatus according to the invention comprises tires cemented with industrial glue to form sewage sedimentation and disposal chambers. 33

A minimum of new materials and labor are required in the method and apparatus, resulting in additional environmental and economic savings. 34

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SEQUENCE LISTING

Not applicable

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invention. Many variations are possible within the teachings of the invention. For example, the basic sealed multiple tire chamber could be utilized as a clear well, wetland cell, distribution box, or other sewage treatment unit. In addition, liquid wastes other than sewage can be processed with this invention. 28

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